AR-B5630 Board

Socket P Intel® Core™2 Duo EPIC SBC with Intel® GME965 Express Chipset , DVI/LCD, Dual LAN and PCI-104 Eexpansion

User Manual

Manual Rev.: 2.0
Book Number: AR-B5630-2010.06.11

Revision

Version	Date	Author	Description
2.0	2010/06/11	Roger Nan	Initial release

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Table of Contents

1 INTRODUCTION

Welcome to the AR-B5630 ECIP AT/ATX Single Board Computer. The AR-B5630 is EPIC board with Socket P Intel Core™2 Duo or Core Duo or Core Solo and Celeron M processor and Intel GM965 + ICH8M Chipset. The memory contents one DDR2 SO-DIMM socket which supports up to 2GB of memory. Graphics display functionality is provided by Build-in Graphic Processor that supports CRT display and LVDS interface with Single or Dual channel panel specifications. Ethernet connectivity comes from the Intel WG82574L10/100/1000 M Ethernet controller.

1.1 Features

- Processor: Core 2 Duo, Core Duo and Celeron M
- Chipsets: GME965 + ICH8M
- Memory: DDR2 667MHz SO-DIMM, Maximum 2GB
- Display: VGA, DVI, LVDS, S-Video, BNC, Component video
- Storage: 1x CF, 1x SATA II, 1x IDE
- Audio: 5.1 CH Audio Realtek ALC662
- Communication: 2x Gbps Ethernet, 4x USB 2.0, 3x RS-232, 1x RS-232/422/485
- General: Watchdog timer, 8-bit GPIO, and PCI-104 expansion slot.

Specifications

Model Name	■ AR-B5630	V 2.0
Product Descriptions	EPIC SBC support 65nm Intel uFC-PGA 478 Core 2 Duo/Core Duo/Core Solo/Celeron M Processors with Dual Gigabit LANs / LCD / TV out / DVI	
General		**Note**
CPU	■ Socket for Intel uFC-PGA 478 Core 2 Duo/Core Duo/Core Solo/Celeron M, Coolers required.	
BIOS	AWARD	
System Chipsets	■ Intel GM965 + ICH8M	
System Memory	■ One SO-DIMM socket support 667/533 MHz DDR2 SDRAM up to 2GB	
Watchdog Timer	Software programmable 1~255 Seconds	
Battery	Lithium Battery, 3V 220mAH	For RTC
Power Requirements	■ AT: 12V Single Voltage Input ■ ATX: power switch pin header and pin header for external 5V stand-by input	Pin Header
Hardware monitoring	1. CPU voltage 2. CPU and System Temperature 3. System and CPU FAN speed 4. System Fan Speed Control same as AR-B1892 (connector color different from CPU Fan connector)	BIOS Support
ProtectU	N/A	

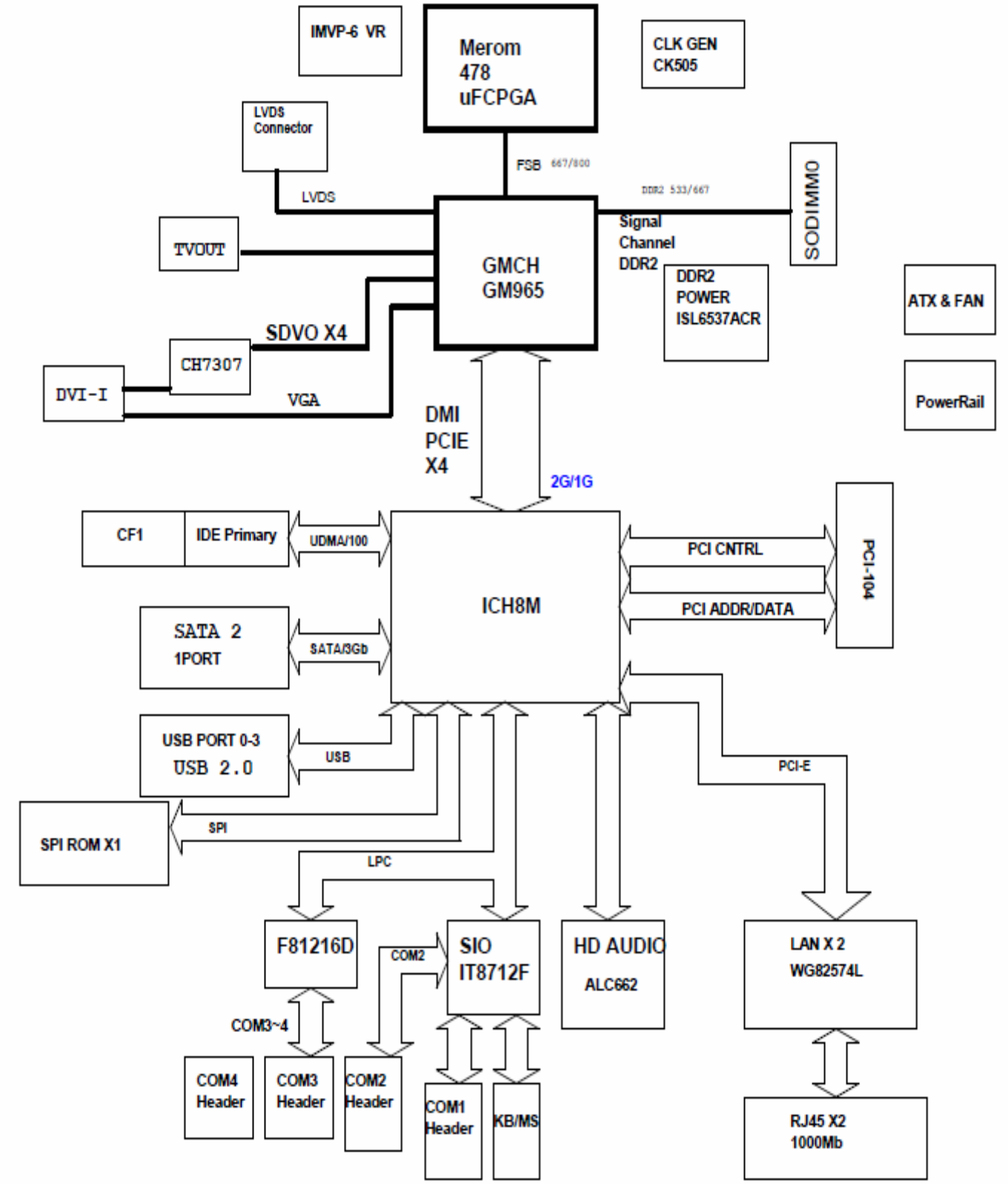
LED	2 LEDs for Power and HDD Power LED (Green), HDD (Orange) refer to AR-B1831	
Button	Reset button (use pin header)	PinHeader(2.0mm)
Fan connector	1. CPU fan 2. System Fan with temperature controller (connector color different from CPU Fan connector)	
OS	Win XP/XP Embedded, WinCE, Linux, Vista	
Video		
Graphic Controller	Intel GM965 integrated GMA X3100 graphic controller VGA Memory: Intel DVMT 4.0 supports Max 224 MB shared video memory Dual Display	
CRT	1 x VGA port	D-Sub15
DVI	1 x DVI port	Pin Header
TV Out	1 x TV Out (S-Video)	Pin header
LCD	1 x Dual Channel 18/24-bits LVDS Interface LCD inverter power connector and ON/OFF control Support 3.3V and 5V LCD	Hirose
Audio		
Audio Interface	5.1 CH Audio Realtek ALC662	Pin Header
Storage		
IDE	1 x E-IDE	44-Pin Header
SSD	1 x Compact Flash Type-II	Type-II Socket
FDC	N/A	
SATA	1 x SATA interface One with standard SATA connector	1xSATAConnector
Network Interface		
Ethernet	1 x Intel WG82574L (10/100/1000Mbps) 1 x Intel WG82574L (10/100/1000Mbps) Boot on LAN, WOL	RJ45
I/O		
Serial Port	1 x RS-232 (COM1)	DB9
	2 x RS-232 (COM3/4) 1 x RS-232/422/485 (COM2)	Pin Header
Touch Screen	N/A	
Parallel Port	N/A	
GPIO	8 Independent TTL level I/O	PinHeader (2x5x2.0)
USB	2 x External ports 2 x Internal ports	Connector Pin Header (1x5x2.0)
Audio	5.1 CH Audio	Pin Header
Expansion slot	1 x PCI-104 (PCI Interface)	Slot
Keyboard/ Mouse	1 x PS/2 for Keyboard and Mouse	Connector
Mechanical		
Dimension	115mm x 165mm (4.528 x 6.496 inches)	
Operating Temperature	0~60°C (32~140°F)	
Storage Temperature	-20~80°C (-4~176°F)	
Relative Humidity	0 to 90% @ 40°C, non-condensing (95% @ 40°C, Non-Condensing by request)	
EMC & Safety		
EMC	CE, FCC Class A	
Safety	N/A	

1.2 Package Contents

In addition to this *User's Manual*, the AR-B5630 package includes the following items:

- AR-B5630 AT/ATX Single Board
- Quick User Guide
- Utility CD(Include driver and Manual)
- Accessory set ACC-5630 series for purchase separately
- ATX POWER cable (PWR2/ CON2) x 1
- DVI cable (DVI1) x 1
- Audio cable (AUDIO1) x 1
- USB Cable (with screws) x 1
- PS/2 to PS/2 Y-cable (KM1) x 1
- 40/44-Pin IDE Cable X1
- Serial port cable (COM) x 2
- SATA HDD Cable (SATA1) x 1
- SATA POWER cable (CON3) x 1

1.3 Block Diagram

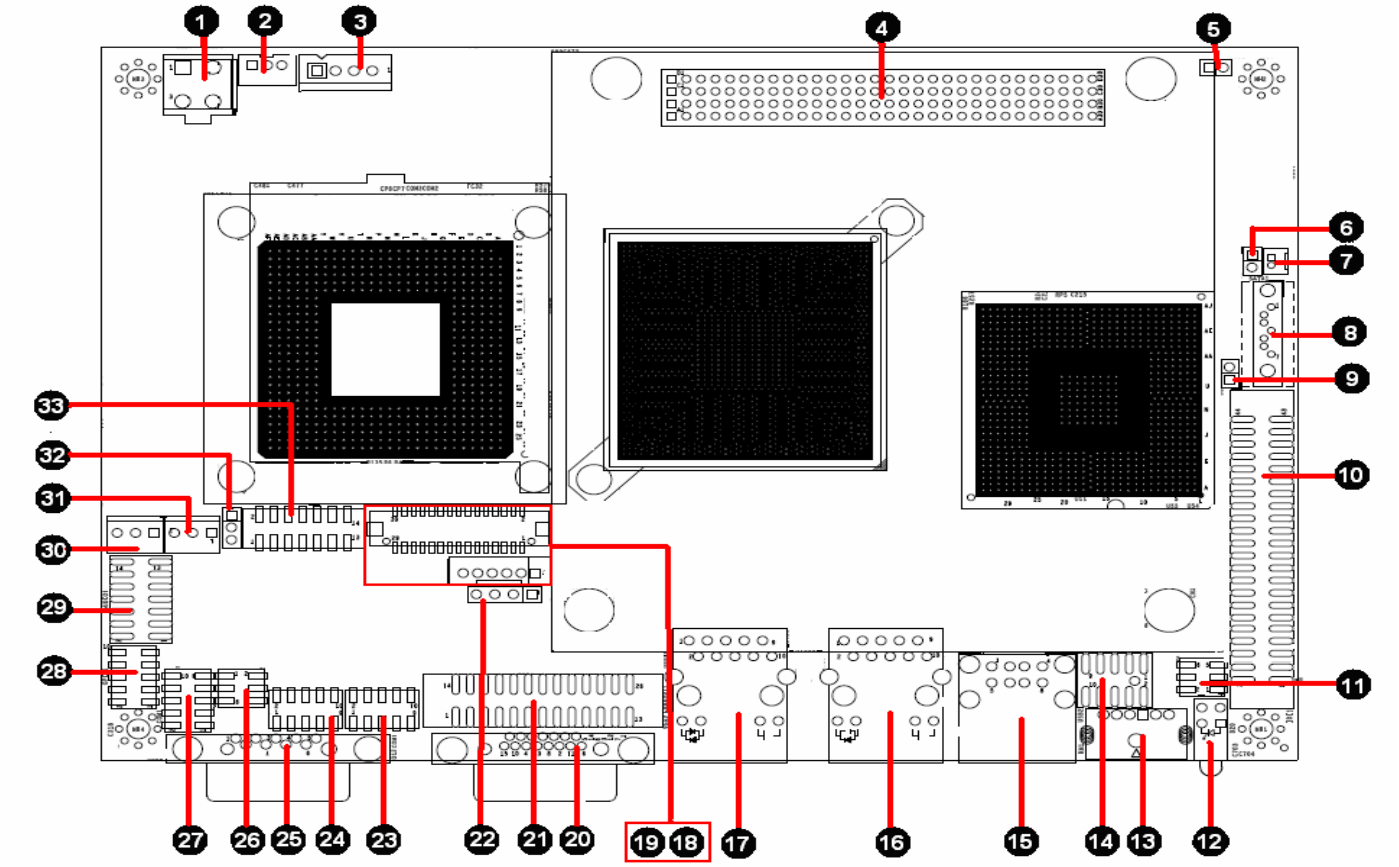


2 H/W INFORMATION

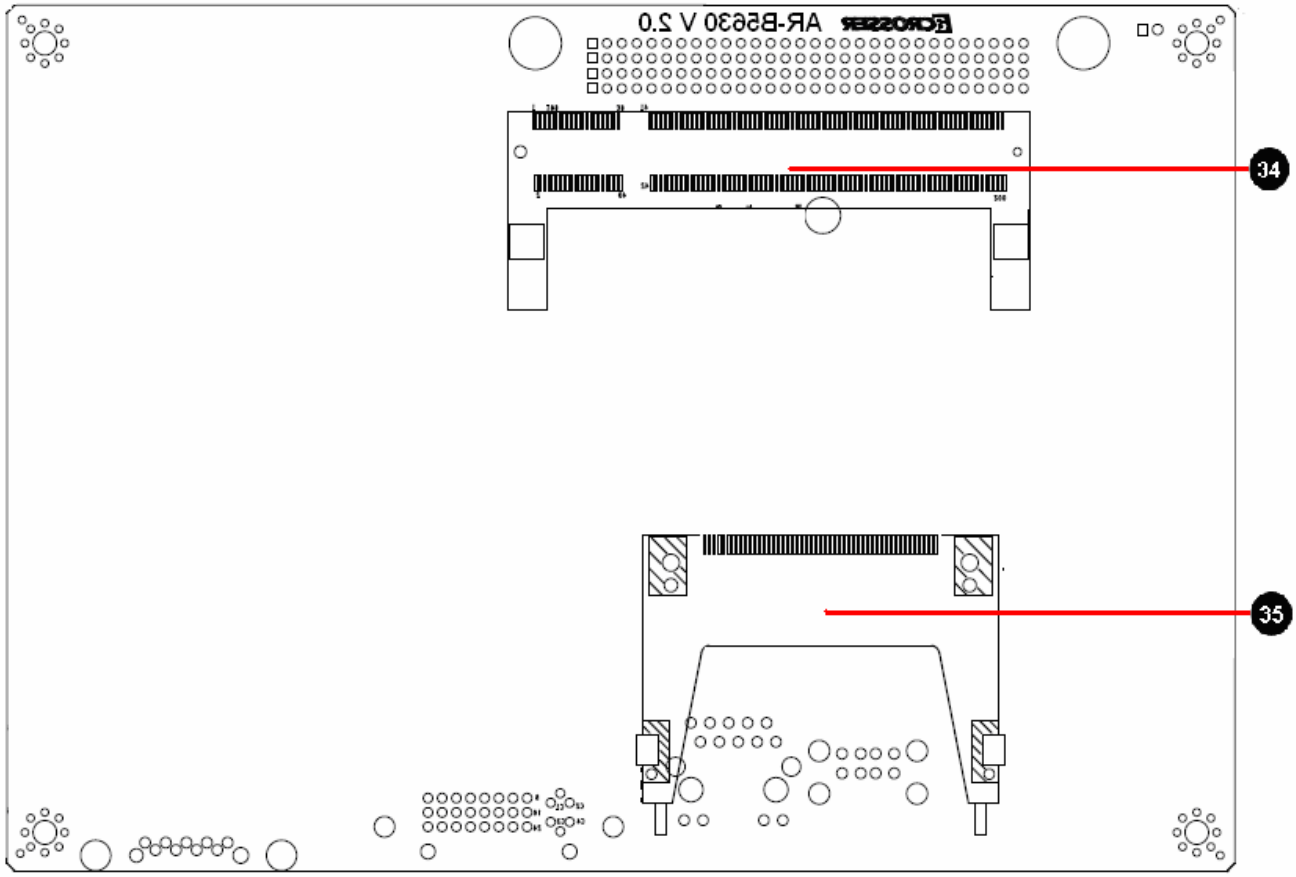
This chapter describes the installation of AR-B5631. At first, it shows the Function diagram and the layout of AR-B5630. It then describes the unpacking information which you should read carefully, as well as the jumper/switch settings for the AR-B5631 configuration.

2.1 Locations

2.1.1 Top Side



2.1.2 Bottom Side

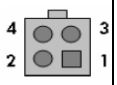


2.1.3 List of Connector and Jumper Setting

1	**PWR2** External +12V DC power input connector.	13	**KM1** Keyboard/Mouse Connnector.	25	**COM1*** External RS232 signal connector for port #1.
2	**CON2** ATX function connector.	14	**USB2** Internal USB2, USB3 connector.	26	**JP1** Select COM2 RS232/422/485.
3	**CON3** Extra +12V and +5V DC power output connector (for SATA device).	15	**USB1** External USB0, USB1 connector.	27	**COM2*** RS-232/422/485 signal connector for port #2.
4	**J10** PCI-104 connector.	16	**LAN2** RJ45 connector for Gigabit Ethernet port #2.	28	**GPIO1** 8-bit TTL-5V GPIO connector.
5	**JP2** Signal SERIRQ connects to PCI-104 pin #B2 selection.	17	**LAN1** RJ45 connector for Gigabit Ethernet port #1.	29	**AUDIO1** 5.1 channels Audio signal connector.
6	**J5** CMOS data retention/clear.	18	**LCD1** LCD panel (LVDS, 18-bit/36-bit) connector.	30	**FAN2** System DC fan connector.
7	**BAT1** CMOS battery holder.	19	**LCDPW1** LCD panel inverter power connector.	31	**FAN1** CPU DC fan connector.
8	**SATA1** SATA device connector #1.	20	**VGA1** Pin Header for D-Sub 15 Pin VGA.	32	**J1** LCD panel driving voltage selection.
9	**J8** CF master or slave select.	21	**DVI1** Digital Video Interface (DVI-D).	33	**TVCON1** TV-out signal connector.
10	**IDE1** PATA connector(UATA-100).	22	**J9** RS422/RS485 signal connector (for COM2).	34	**SODIMM1** DDR2 SO-DIMM Slot.
11	**J12** Front panel connector. (NOTE 1)	23	**COM3*** RS232 signal connector for port #3.	35	**CF1** CF card socket.
12	**D20** System standby power and HDD access indicators.	24	**COM4*** RS232 signal connector for port #4.		

2.2 Connector and Jumper Setting Table

1. PWR2: External +12V DC power input connector.



PIN	SETTING
1	GND
2	GND
3	+12V
4	+12V

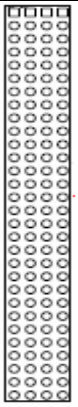
2. CON2: ATX function connector.

PIN	SETTING
1	GND
2	PS_ON
3	+5V_SUS

3. CON3: Extra +12V and +5V DC power output connector (for SATA device).

PIN	SETTING
1	+12V
2	GND
3	+3.3V
4	+5V

4. J10: PCI-104 connector.



PCI-104 connector.

5. JP2: Signal SERIRQ connects to PCI-104 pin #B2 selection.

STATUS	SETTING
Open	Disconnected. (Default)
Short	Connected.

6. J5: CMOS data retention/clear.

STATUS	SETTING
Open	Disconnected. (Default)
Short	Connected.

7. BAT1: CMOS battery holder.

CMOS battery holder.

8. SATA1: SATA device connector #2.

SATA device connector #2.

9. J8: CF master or slave select.

STATUS	SIGNAL
SHORT	MASTER
OPEN	SLAVE(Default)

10. IDE1: PATA connector.

PIN	SIGNAL	PIN	SIGNAL
1	RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	DREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	IORDY	28	GND
29	DACK#	30	GND
31	IDEIRQ	32	NC
33	A1	34	PDIAG
35	A0	36	A2
37	DCS1#	38	CS3
39	IDE_LED#	40	GND
41	+5V	42	+5V
43	GND	44	NC

11. J12: Front panel connector. (NOTE 1)

STATUS	SETTING
1, 2	External buzzer. 1: Buzz + 2: Buzz -
3, 4	Hardware reset
5, 6	Power button for ATX mode; jumper shorted for AT mode.

12. D20: System standby power and HDD access indicators.

Green: Standby power indicator.
Yellow: HDD access indicator.

13. KM1: Keyboard/Mouse CONNECTOR

Keyboard/Mouse connector.

14. USB2: Internal USB2, USB3 connector.

PIN	SIGNAL	PIN	SIGNAL
1	+5V	2	+5V
3	USB_3-	4	USB_2-
5	USB_3+	6	USB_2+
7	GND	8	GND
9	GND	10	GND

15. USB1: External USB0, USB1 connector.

PIN	SIGNAL	PIN	SIGNAL
1	+5V	5	+5V
2	USB_1-	6	USB_0-
3	USB_1+	7	USB_0+
4	GND	8	GND

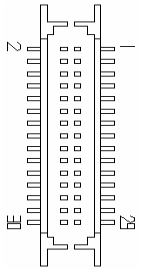
16. LAN2: RJ45 connector for Gigabit Ethernet port #2

RJ45 connector for Gigabit Ethern*et* port #2.

17. LAN1: RJ45 connector for Gigabit Ethernet port #1

RJ45 connector for Gigabit Ethern*et* port #1.

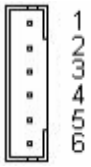
18. LCD1: LCD panel (LVDS, 18-bit/36-bit) connector.



PIN	SETTING	PIN	SETTING
1	LCD VDD	**2**	GND
3	E CLK-	**4**	E CLK+
5	GND	**6**	E Data2-
7	E Data2+	**8**	GND
9	E Data1-	**10**	E Data1+
11	NC	**12**	NC
13	E Data0+	**14**	E Data0-
15	GND	**16**	O CLK+
17	O CLK-	**18**	GND
19	O Data2+	**20**	O Data2-
21	I2C CLK	**22**	O Data1+
23	O Data1-	**24**	I2C Data
25	O Data0+	**26**	O Data0-
27	NC	**28**	NC
29	LCD VDD	**30**	LCD VDD

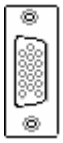
E: Even for dual channel.
O: Odd for single channel.

19. LCDPW1: LCD panel inverter power connector.



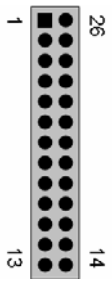
PIN	SETTING
1	+12V
2	+12V
3	GND
4	BKL ON
5	GND
6	Reserved.

20. VGA1: Pin Header for D-Sub 15 Pin VGA.



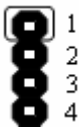
PIN	SIGNAL	PIN	SIGNAL
1	**R**	2	**GND**
3	**G**	4	**GND**
5	**B**	6	**GND**
7	**VSYNC**	8	**SCL**
9	**HSYNC**	10	**SDA**

21. DVI1: Digital Video Interface (DVI-D).



PIN	SIGNAL	PIN	SIGNAL
1	TD2- (Digital red-)	13	N.C
2	TD2+ (Digital red+)	14	+VCC
3	GND	15	GND
4	N.C	16	Hot plug detect
5	N.C-	17	TD0- (Digital blue-)
6	DDC clock	18	TD0+ (Digital blue+)
7	DDC data	19	GND
8	N.C	20	N.C
9	TD1- (Digital green-)	21	N.C
10	TD1+ (Digital green-)	22	GND
11	GND	23	TCLK- (Digital clock-)
12	N.C	24	TCLK+ (Digital clock+)

22. J9: RS422/RS485 signal connector (for COM2).



PIN	SETTING
1	RS485 DATA+ or RS422 TX+
2	RS485 DATA- or RS422 TX-
3	RS422 RX+
4	RS422 RX-

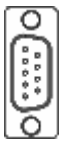
23. COM3*: RS232 signal connector for port #3.

PIN	SETTING	PIN	SETTING
1	DCD #2	2	DSR #2
3	RX #2	4	RTS #2
5	TX #2	6	CTS #2
7	DTR #2	8	RI #2
9	GND	10	NC

24. COM4*: RS232 signal connector for port #4.

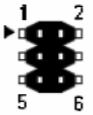
PIN	SETTING	PIN	SETTING
1	DCD #3	2	DSR #3
3	RX #3	4	RTS #3
5	TX #3	6	CTS #3
7	DTR #3	8	RI #3
9	GND	10	NC

25. COM1*: RS-232 signal connector for port #1.



D-SUB-9 male connector for RS232 port #1.

26. JP1: Select COM2 RS232/422/485.



STATUS	JP1
RS-232	1-2
RS-422	3-4
RS-485	5-6

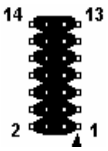
27. COM2*: RS232 signal connector for port #2.

PIN	SETTING	PIN	SETTING
1	DCD #2	2	DSR #2
3	RX #2	4	RTS #2
5	TX #2	6	CTS #2
7	DTR #2	8	RI #2
9	GND	10	NC

28. GPIO1:8-bit TTL-5V GPIO connector.

PIN	SETTING	PIN	SETTING
1	GPIO0 [30]	2	+5V
3	GPIO1 [31]	4	GPIO7 [37]
5	GPIO2 [32]	6	GPIO6 [36]
7	GPIO3 [33]	8	GPIO5 [35]
9	GND	10	GPIO4 [34]

29. AUDIO1: 5.1 channels Audio signal connector.



PIN	SETTING	PIN	SETTING
1	Line-out Right	2	Line-out Left
3	AGND	4	AGND
5	Line-in Right	6	Line-in Left
7	MIC-in	8	AGND
9	AGND	10	AGND
11	SR-out Right	12	SR-out Left
13	LFT-out	14	SEN-out

30. FAN2: System DC fan connector.

PIN	SETTING
1	GND
2	+12V
3	Fan speed data

ON/OFF controlled by system temperature setting of BIOS.

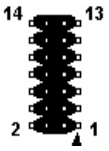
31. FAN1: CPU DC fan connector.

PIN	SETTING
1	GND
2	+12V
3	Sense

32. J1: LCD panel driving voltage selection.

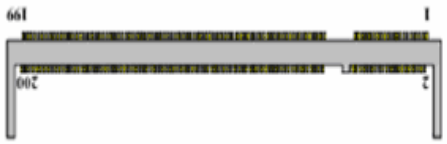
STATUS	SETTING
1-2	+5V for LCD panel.
2-3	+3.3V for LCD panel. (Default).

33. TVCON1: TV-out signal connector.

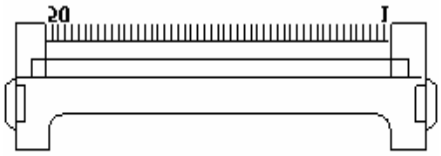


PIN	SETTING	PIN	SETTING
1	Y-G	2	N/A
3	GND	4	N/A
5	CVBS/Pb-G	6	N/A
7	GND	8	N/A
9	C/Pr-G	10	N/A
11	GND	12	N/A
13	GND	14	N/A

34. SODIMM1: DDR2 SO-DIMM SLOT.



35. CF1: CF CARD SOCKET.



*:1. COM1 is the external UART RS-232 port, the text description on the PCB board is “CON1”.

*:2. COM2 is the internal UART RS-232/422/485 port, the text description on the PCB board is “COM1”.

*:3. COM3 is the internal UART RS-232 port, the text description on the PCB board is “COM2”.

*:4. COM4 is the internal UART RS-232 port, the text description on the PCB board is “COM3”.

3 BIOS SETTING

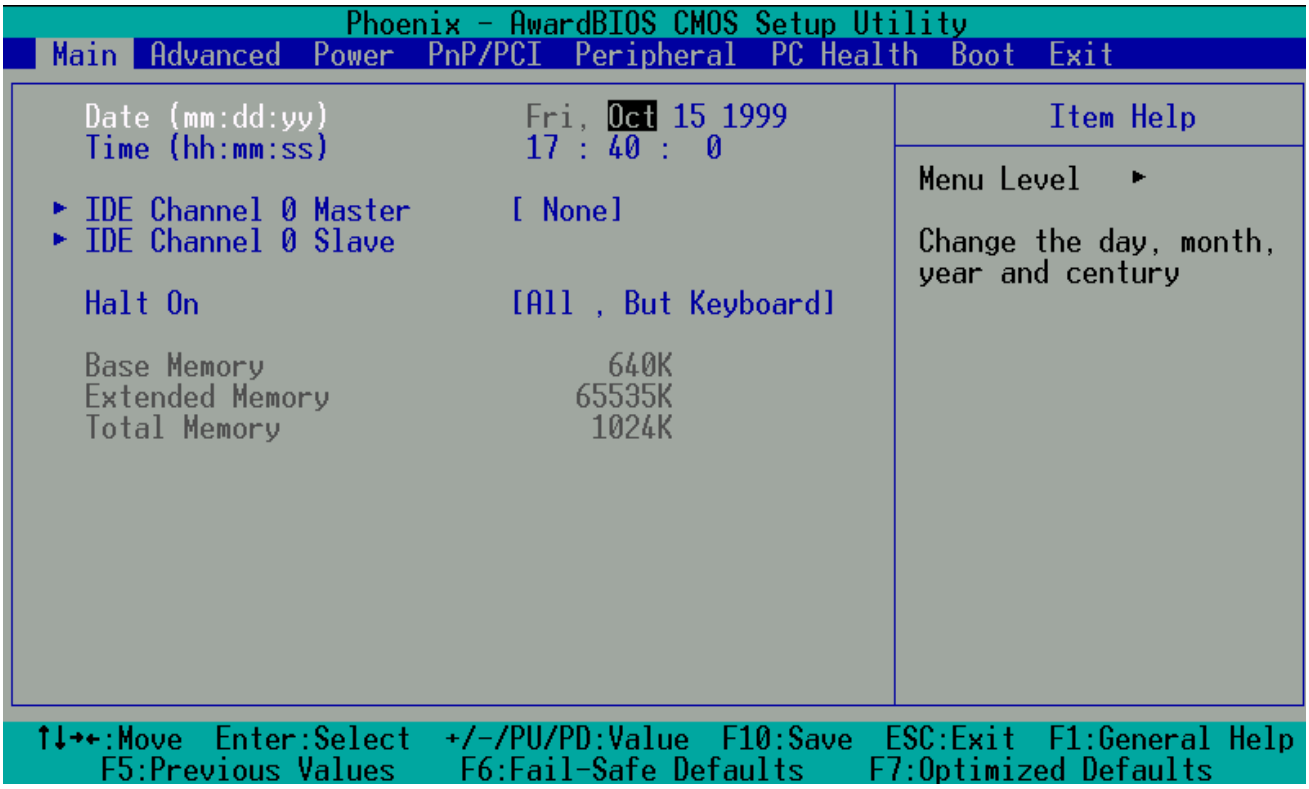
This chapter describes the BIOS menu displays and explains how to perform common tasks needed to get the system up and running. It also gives detailed explanation of the elements found in each of the BIOS menus. The following topics are covered:

- Main Setup
- Advanced Chipset Setup
- Power Setup
- PnP/PCI Setup
- Peripherals Setup
- PC Health Setup
- Boot Setup
- Exit Setup

Once you enter the Award BIOS™ CMOS Setup Utility, the Main Menu will appear on the screen. Use the arrow keys to highlight the item and then use the <Pg Up> <Pg Dn> keys to select the value you want in each item.

3.1 Main Setup

The <Main Setup> choice allows you to record some basic hardware configuration in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run this Setup option, however, if you change your system hardware configuration, the onboard battery fails, or the configuration stored in the COMS memory was lost or damaged.

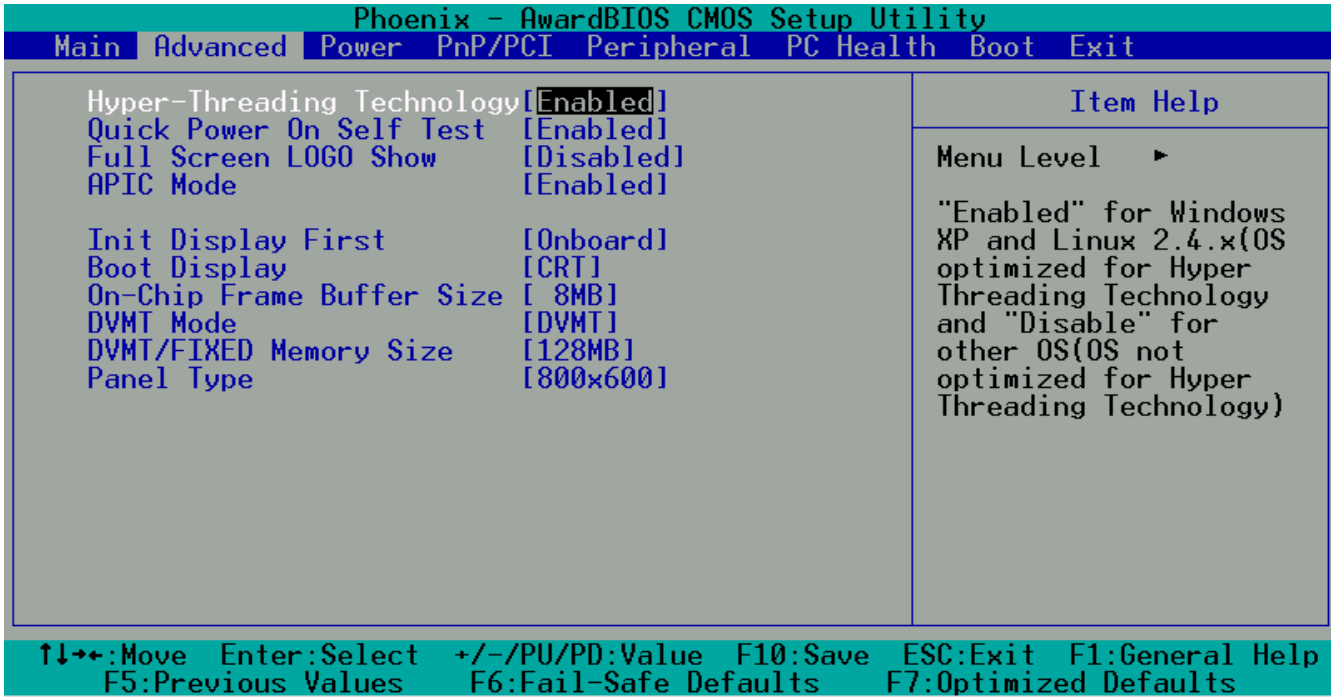


Note: Listed at the bottom of the menu are the control keys. If you need any help with the item fields, you can press the <F1> key, and it will display the relevant information.

Option	Choice	Description
Date Setup	N/A	Set the system date. Note that the 'Day' automatically changes when you set the date
Time Setup	N/A	Set the system time
IDE Channel 0 Master/Slave	N/A	The onboard IDE connectors provide 1 channel for connecting up to 2 IDE hard disks or other devices. The first is the "Master" and the second is "Slave", BIOS will auto-detect the IDE type.
Halt On	All Errors, No Errors, All but keyboard.	Select the situation in which you want the BIOS to stop the POST process and notify you.

3.2 Advanced Chipset Setup

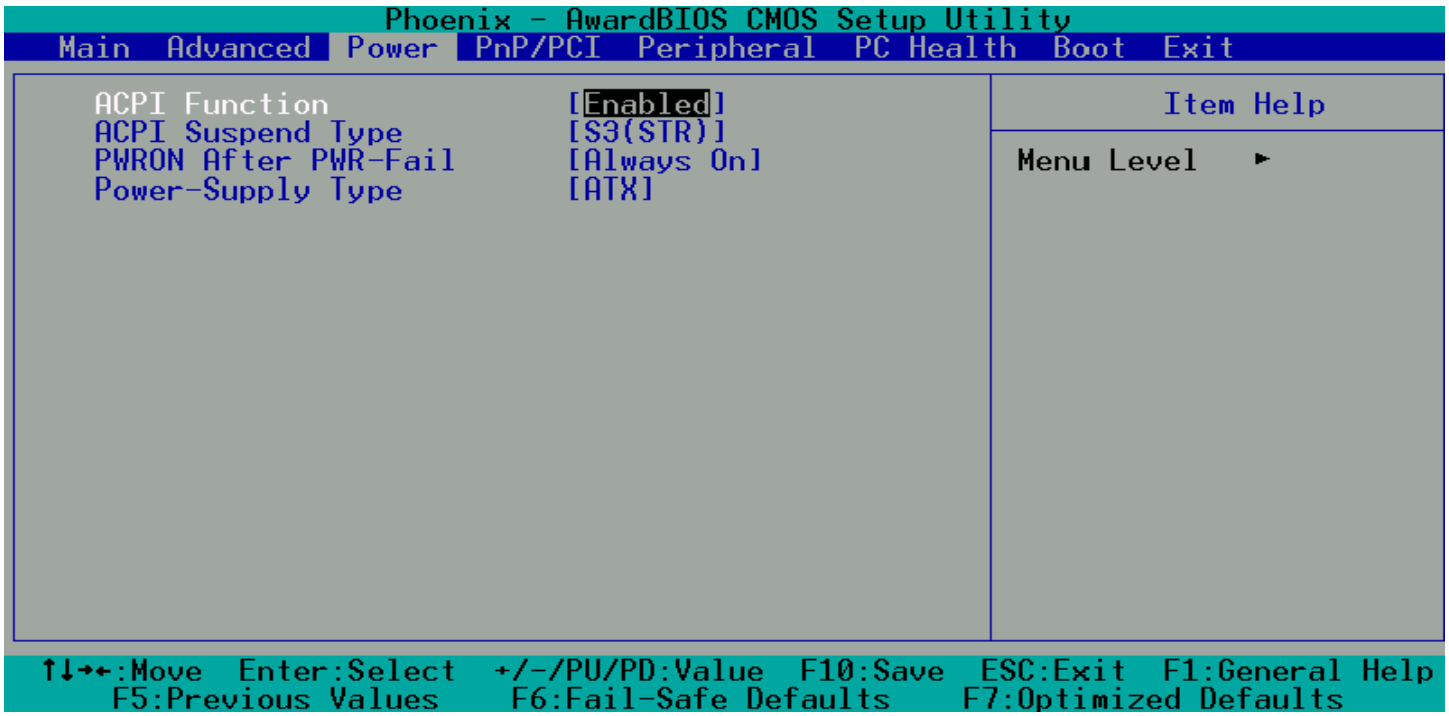
This section allows you to configure and improve your system and follows you to set up some system features according to your preference.



Option	Choice	Description
Quick Power On Self Test	Enabled Disabled	This category speeds up Power On Self Test (POST) after you have powered up the computer. If it is set to Enable, BIOS will shorten or skip some check items during POST.
Full Screen Logo Show	Enabled Disabled	Select Enabled to show the OEM full screen logo if you have add-in BIOS.
VGA Share Memory Size	1M 8M	This Item is for setting the Frame Buffer (Share system memory as display memory).
Boot Display	CRT DVI LCD TV CRT+DVI CRT+LCD CRT+TV	This Item is to set display device

3.3 Power Setup

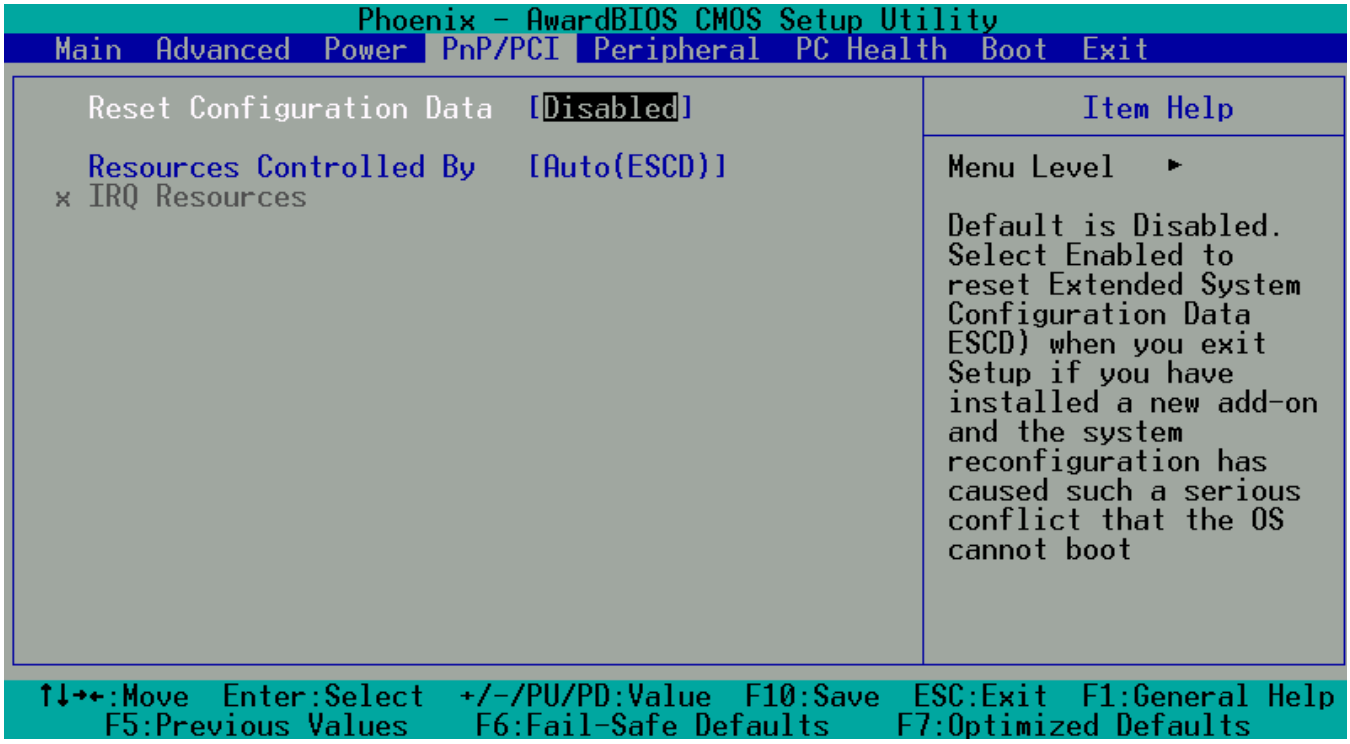
Use this main to specify your setting for power management.



Option	Choice	Description
ACPI Function	Enabled Disabled	Enable this function to support ACPI (Advance Configuration and Power Interface).
ACPI Suspend Type	S1 (POS) S3 (STR) S1+S3.	This options for this field are S1 (POS) and S3 (STR). By default, the field is set to S1 (POS) PWRON After PWR-Fail.
Power –Supply Type	AT ATX	This item allows you to choose the Type of Power Supply in use.The Choice: AT, ATX.

3.4 PnP/PCI Setup

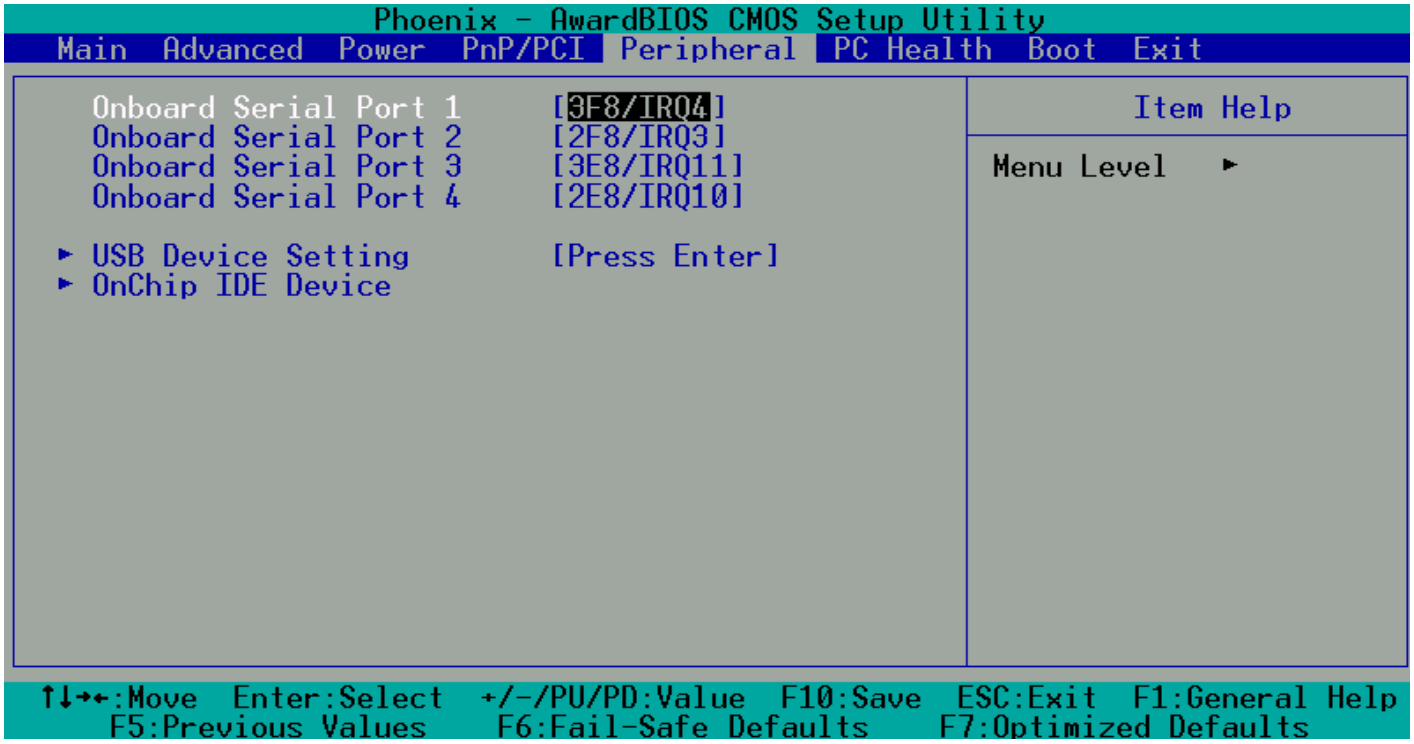
The option configures the PCI bus system. All PCI bus system on the system use INT#, thus all installed PCI cards must be set to this value.



Option	Choice	Description
Reset Configuration Data	Enabled Disabled	Normally, you leave this field Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup. If you have installed a new add-on and the system reconfiguration has caused such a serious conflict, then the operating system cannot boot.
Resources Controlled By	Auto(ESCD) Manual	The Award Plug and Play BIOS has the capacity to automatically configure all of the boot and Plug and Play compatible devices. However, this capability means absolutely nothing unless you are using a Plug and Play operating system such as Windows 95. If you set this field to “manual,” then you may choose specific resources by going into each of the submenus.
IRQ Resources	N/A	When resources are controlled manually, assign a type to each system interrupt, depending on the type of the device that uses the interrupt

3.5 Peripherals Setup

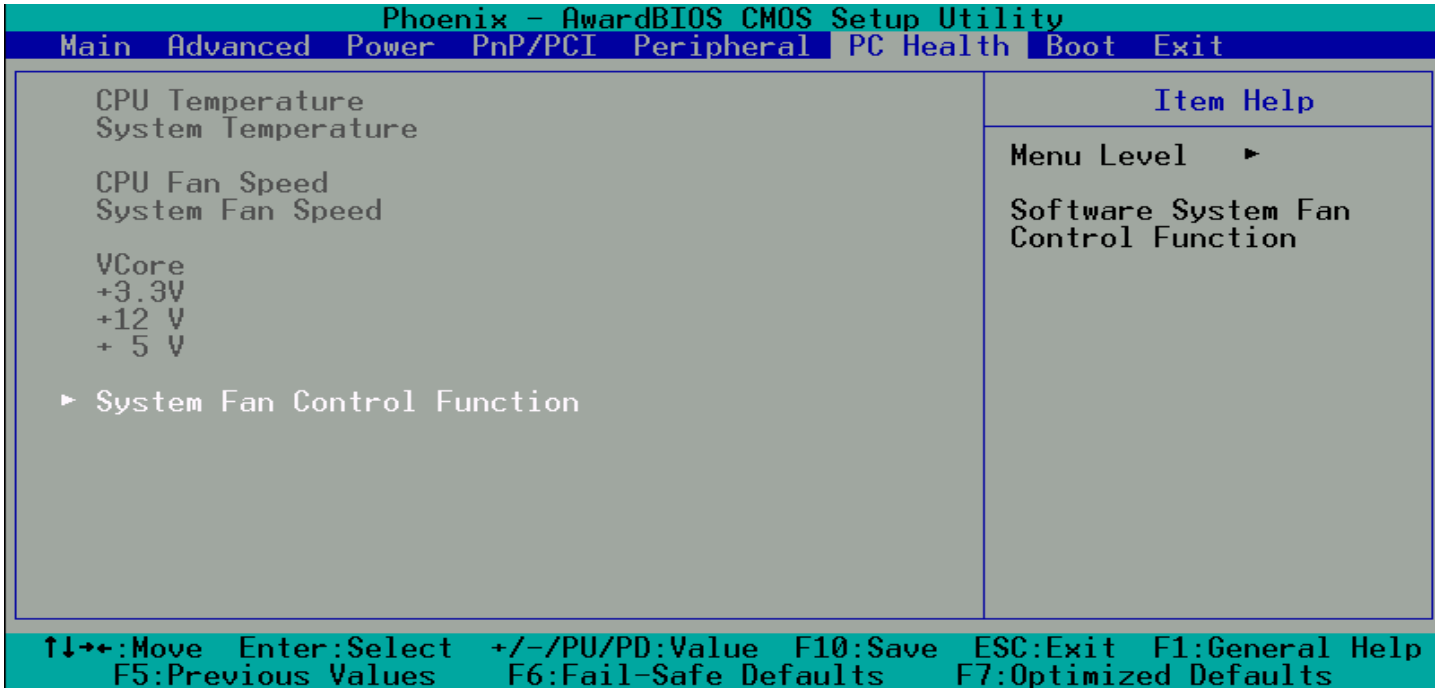
This option controls the configuration of the board's chipset. Control keys for this screen are the same as for the previous screen.



Option	Choice	Description
Onboard Serial Port 1 **Onboard Serial Port 2** **Onboard Serial Port 3** **Onboard Serial Port 4**	Serial Port 1: 3F8 / IRQ11 Serial Port 2: 2F8 / IRQ10 Serial Port 3: 3E8 / IRQ9 Serial Port 4: 2e8 / IRQ8	Select an address and the corresponding interrupt for each serial port.
USB Device Setting	Enabled Disabled	Select *Enabled* if your system contains a Universal Serial Bus (USB) 2.0 controller and you have USB peripherals
On chip IDE DEVICE		The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately.

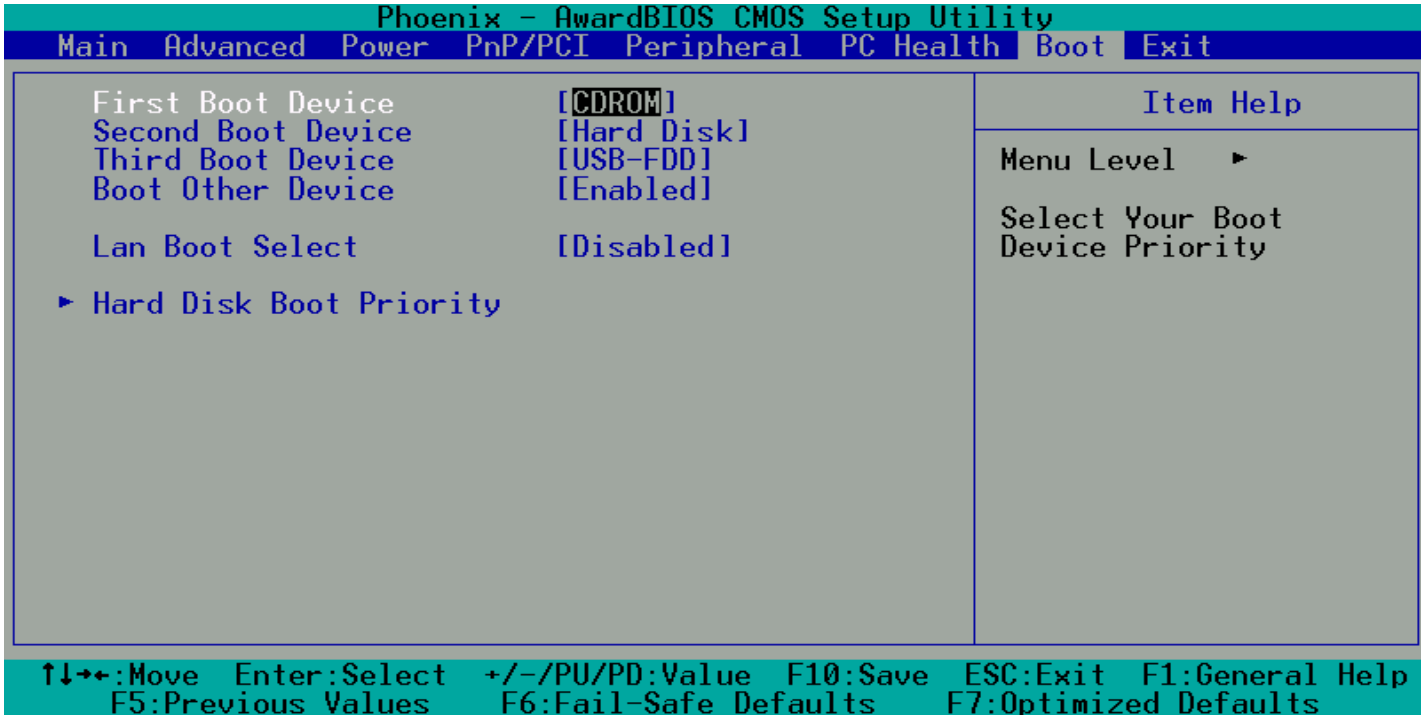
3.6 PC Health Setup

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds, and voltages.



3.7 Boot Setup

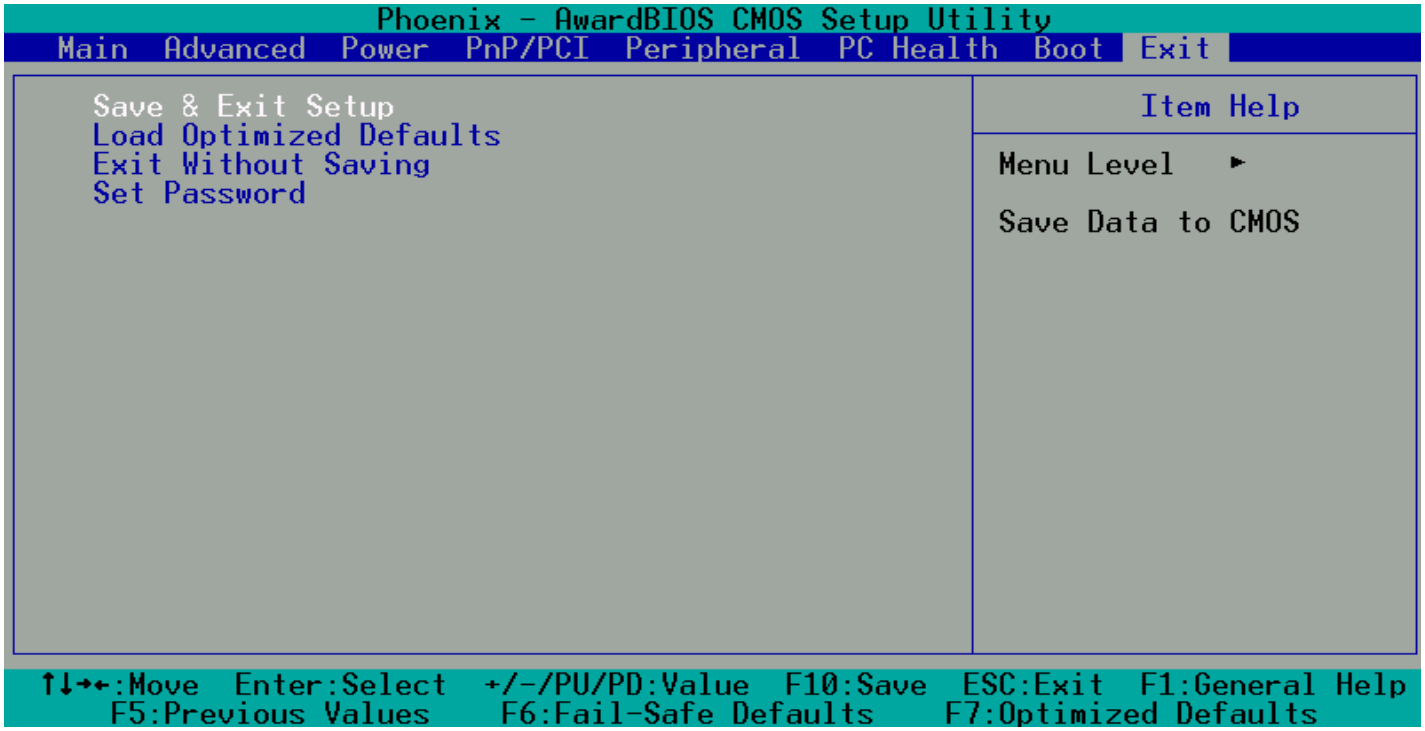
This section is used to exit the BIOS main menu. After making your changes, you can either save them or exit the BIOS menu and without saving the new values.



Option	Choice	Description
First / Second / Third Boot Device/Other Boot Device	Hard Disk CDROM USB-FDD USB-CDROM Disabled	The BIOS attempts to load the operating system from the devices in the sequence selected in these items.
Hard Disk Boot Priority	N/A	These fields set the Boot Priority for each Hard Disk (SATA/IDE HDD and USB Flash)

3.8 Exit Setup

This section is used to configure exit mode.



Option	Choice	Description
Save & Exit Setup	Pressing <Enter> on this item for confirmation: Save to CMOS and EXIT (Y/N)? Y	Press “Y” to store the selections made in the menus in CMOS – a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again
Load Optimized Defaults	When you press <Enter> on this item you get a confirmation dialog box with a message like this: Load Optimized Defaults (Y/N)? N	Press ‘Y’ to load the default values that are factory-set for optimal-performance system operations.
Exit Without Saving	Pressing <Enter> on this item for confirmation: Quit without saving (Y/N)? Y	This allows you to exit Setup without storing any changes in CMOS. The previous selections remain in effect. This shall exit the Setup utility and restart your computer.

Set Password	Pressing <Enter> on this item for confirmation: ENTER PASSWORD:	When a password has been enabled, you will be prompted to enter your password every time you try to enter Setup. This prevents unauthorized persons from changing any part of your system configuration. Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previous password from the CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <Esc> to abort the selection and not enter a password. To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm that the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

3.9 BIOS Update

The BIOS program instructions are contained within computer chips called FLASH ROMs that are located on your system board. The chips can be electronically reprogrammed, allowing you to upgrade your BIOS firmware without removing and installing chips.
The AR-B5630 provides the FLASH BIOS update function for you to easily to update to a newer BIOS version. Please follow these operating steps to update to new BIOS：

Step 1: Turn on your system and don't detect the CONFIG.SYS and AUTOEXEC.BAT files.

Step 2: You will get **AWDFLASH.EXE** and **XXXXXX.BIN ,** please copy them to the boot disk .

Step 3: In the MS-DOS mode, you can type the AWDFLASH and press [ENTER] .

A:\> AWDFLASH

Step 4: A window will appear and ask you to type the complete BIOS file (**xxxxxx.BIN**) and press [ENTER] .

Step 5: Then it will ask whether you save the old BIOS file , you can choose the YES or NO .

Step 6: Then it will ask you whether want to program it , please choose YES .

Step 7: The BIOS will start to upgrade

Step 8: When you have successfully flashed the BIOS then press the[F1] to reboot the Computer and hit [DEL] to enter the BIOS CMOS SETTING . Select " LOAD S-STUP DEFAULTS " set as YES . Then save and exit the setting

Note：

1. In order to prevent your system from hanging up during flashing BIOS , please check the new BIOS match your model name and current BIOS version .
2. In order to protect your motherboard , please don't turn off your computer during the flashing or it will damage your BIOS ROM .

- Watch Dog Timer Reset Sample Code (IT8712F-A/IX-L)

The WDT (Watch Dog Timer) is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

The watchdog timer is a circuit that maybe used from your program software to detect crash or hang up. The Watchdog timer is automatically disabled after reset. Once you enabled the watchdog timer, your program should trigger the watchdog timer every time before it times out. After you trigger the watchdog timer, the timer will be set to zero and start to count again. If your program fails to trigger the watchdog timer before times out, it will generate a reset pulse to reset the system or trigger the IRQ 9 signal in order to tell your system that the watchdog time is out.

User could test watchdog function under 'Debug' program as follows:

```
C:>debug

    o 2E 87   ;Extended Functions Enable Register

    o 2E 01   ;Extended Functions Enable Register

    o 2E 55   ; Extended Functions Enable Register

    o 2E 55   ; Extended Functions Enable Register

    o 2E 07   ;EFIR=EFER (Extended Functions Index Register)
                    point to Logical Device Number Reg.

    o 2F 07   ; Select logical device 7, (Watchdog Function)

    o 2E 23   ; Clock Source Select of Watch Dog Timer

    o 2F 10   ; Select Eeternal CLKIN

    o 2E 72 ; Select Watchdog count mode seconds or minutes

    o 2F C0    ; Default is second and KBRST mode.

    o 2E 73 ; Select Watchdog Timer Value

    o 2F 08   ;update CRF6 with value 08H ,(8sec reset)
```

```
// Set Watchdog
        outportb(IO_Port_Address,0x07);      // Point to Logical Device Number Reg.
   outportb(IO_Port_Address+1,0x07);    // Select logical device 7, (Watchdog Function)

   outportb(IO_Port_Address,0x23);  // Select Watchdog use CLKIN
   outportb(IO_Port_Address+1,inportb(IO_Port_Address+1)|0x10);

   outportb(IO_Port_Address,0x72);  // Select Watchdog use keyboard reset
   outportb(IO_Port_Address+1,0x40);

   outportb(IO_Port_Address,0x72);  // Select Watchdog count mode seconds or minutes
   outportb(IO_Port_Address+1,inportb(IO_Port_Address+1)|0x80); // Set Second

   outportb(IO_Port_Address,0x73);  // Set Watchdog Timer Value
   outportb(IO_Port_Address+1,Time);    // 0x00 to disable, max 0xFF
```

■ **NOTE 1:**

J12: Front panel connector.

STATUS	SETTING
1, 2	External buzzer. 5: Buzz + 6: Buzz -
3, 4	Hardware reset
5, 6	Power button for ATX mode; jumper shorted for AT mode.

When using **AT mode** in the system, the pin9-10 of header **J12** must be shorted. If using **ATX mode** in the system, the pin5-6 of header **J12** should connect to a **Push-Button-Switch**.

NOTE: When using AT mode, the monitor will not display any message and the system will not auto-shut down after soft-off. In this case, please cut the PSU's power off or remove PSU's power to cut the system power off.